Gut Bay, Kook, and Hoktaheen Lakes subsistence sockeye salmon stock assessment project, 2001

Abstract: Sockeye salmon (*Oncorhynchus nerka*) returning to Gut Bay, Kook, and Hoktaheen lakes are an important subsistence resource for the people of Kake, Angoon, and Hoonah. The Gut Bay, Kook, and Hoktaheen Lakes Sockeye Salmon Stock Assessment Project was initiated because of concerns about the potential increase in harvest of sockeye salmon returning to these lake systems. The project evaluates sockeye salmon production at various life stages and assesses lake productivity. This annual report summarizes work conducted during the first year of project operations, 2001.

Portions of the spawning sockeye salmon populations in Gut Bay Lake, Kook Lake, and Hoktaheen Lake were estimated through observer counts and mark-recapture studies; age, length, and sex composition of these populations were estimated using standard measurements and scale sampling and analysis. Sockeye salmon fry populations in each lake were estimated using hydroacoustic and trawl sampling. Baseline information was collected on the physical characteristics and productivity of lake rearing habitat in each system using standard limnological sampling procedures. Gut Bay Lake appeared to have low spawning escapement, but observer counts increased late in the season. By contrast, sockeye salmon fry density was high in Gut Bay Lake, although this result should be interpreted cautiously until more data are collected. Zooplankton density, body size, and biomass were low in Gut Bay Lake. Kook Lake also appeared to have low escapement, with a mark-recapture estimate of 378 (95% CI 254 – 702). Logs and other large woody debris had built up to form a barrier in the Kook Lake outlet stream; this was cleared in August prior to any observed escapement into the lake. The sockeye salmon fry population in Kook Lake was very low, perhaps as a result of the partial barrier being in place for many years. Water quality values and secondary production in Kook Lake were average compared to similar organically stained, sockeye salmon rearing lakes in Southeast Alaska, and indicate the lake may be able to support a larger sockeye salmon fry population. In Hoktaheen Lake, a spawning population of 745 (95% CI 617 – 967) sockeye salmon was estimated in the single major inlet stream; sockeye salmon were also observed spawning in the outlet stream but not included in the mark-recapture study. The fry population density was relatively high, and zooplankton density was also high, particularly in the larger cladocerans preferred by sockeye salmon fry.

This year's results provide the foundation for a multiple-year study to assess the health of the sockeye salmon stock in Gut Bay, Kook, and Hoktaheen lakes and to set a range of escapement goals capable of sustaining these populations for many generations.

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